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MODEL 752A
DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER

THE HICKOK ELECTRICAL INSTRUMENT COMPANY · 10514 Dupont Avenue, Cleveland 8, Ohio

INSTRUCTION BOOK

HICKOK MODEL 752A

DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER

Your Hickok Tube Tester has been designed to provide you with the latest improvements in tube tester engineering. To take full advantage of the many new features incorporated into your Model 752A

READ YOUR INSTRUCTION BOOK

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CHAPTER I - INTRODUCTION

Section 1. 1: General Description

The Hickok Model 752ATube Tester combines the characteristics of accuracy and dependability together with the advantages of portability and simplicity of operation to meet the needs of those technicians who maintain modern electronic equipment. The design specifications of the Model 752A include the very latest tube-testing techniques to provide an accurate evaluation of the performance capabilities of electron-tubes of the receiving and low power transmitting types.

The Model 752A employs the Dynamic Mutual Conductance test method to evaluate electron-tubes of the amplifier type. The results obtained from this test method are indicative of the performance capabilities of a tube in actual equipment operation. The dynamic mutual conductance of the tube under test is quantitatively indicated directly in micromhos on the test meter.

The Model 752A employs a controlled emission test to provide a meaningful evaluation of diode tubes of the rectifier and detector types. The instrument also provides a voltage regulator tube test circuit which permits the testing of voltage regulator tubes in accordance with tube manufacturer's handbook operating conditions.

To insure a complete evaluation of the tube under test, the Model 752A provides three basic fringe tests: (1) An interelement short and leakage test is provided as a preliminary check on all electron-tubes. The resistance of interelement leakage paths is measured directly in ohms on the test meter. (2) A gas test is also provided; this test is an integral step in the evaluation of any amplifier type tube. (3) A life test, which determines the efficiency of the cathode, is provided to forecast the future life of the tube under test.

The outstanding feature of the Model 752A is the dual tube test which permits the testing of electron-tubes containing electrically similar sections with one setting of the selector switches. Each section of the tube is independently tested for interelement leakage, performance capability, and gas by simply depressing an additional push-button which transfers the tube test conditions from one section of the tube to the other. This feature is particularly useful when testing and selecting tubes for use in balanced circuits.

Many new mechanical design features have been incorporated into this tester to facilitate the rapid selection of the proper test conditions for the tube under test. The panel layout is designed to provide a direct correlation between the order in which the roll chart data is presented and the order in which the tube-test selector switches are arranged. This arrangement not only reduces the time needed for testing a tube, but also reduces the possibility of operator-error in setting up the specific tube test conditions. To further reduce the time normally required in testing tubes and to aid in the interpretation of test results, the test meter scales have been simplified. Mutual conductance values are indicated on one basic 0-1500 micromho scale. The Gm of the tube under test can be determined by multiplying the indicated meter reading by the multiplier selector switch setting. Separate meter scales are provided for the interelement leakage and voltage regulator test circuits.

The Model 752A also makes available on its main panel ten of the most commonly used tube sockets. The various tube parameters are applied to the pins of these tube sockets through anti-oscillation wiring by a system of rotary selector switches. These selector switches are numbered in accordance with the EIA system of tube pin designation, and are wired in such a way that they are electrically interlocked to prevent the application to two different test potentials to the same tube pin. This not only prevents damage to the tube under test, but also prevents damage to the tester.

The following special tube adapters are available for use with the Model 752A

NOMENCLATURE	HICKOK CODE NO.
Adapter: Cathode ray tube	1050-28
Adapter: 2C39A tube	1050-50
Adapter: Long-Lead Subminiature Tube	1050-89
Adapter: 829B tube	1050-107
Adapter: 4X150A/4X250B tube	1050-109
Adapter: 991 tube	1050-118
Adapter: 2C36 tube	1050-119
Adapter: 2-01C tube	1050-120
Adapter: 6263, 6173, 5675 pencil tubes	1050-121

The built-in roll chart provides the test data for all the tubes normally encountered in the servicing of modern electronic equipment. The roll chart is replacable, and generally it is revised semi-annually to include data on tubes available at the time of each printing. Revised roll charts can be ordered direct from the factory.

Detailed information on the physical and electrical properties of the Model752Acan be found in the Specifications Section 1-2.

To ensure safe, accurate and efficient service from your tube tester, Chapter II (Operating Instructions), should be carefully read and understood.

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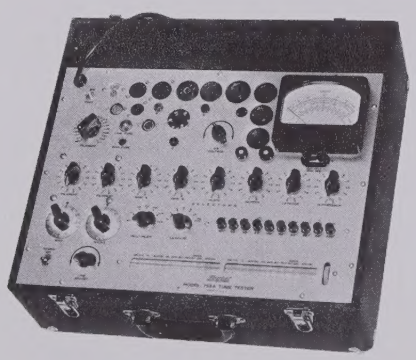


Figure 1. Model 752A Dynamic Mutual Conductance Tube Tester

Section 1-2: Model 752A Specifications

I. POWER REQUIREMENTS:

A. Voltage: 105-125 volts.
B. Frequency: 60 cycles.
C. Power Consumption: 40 watts, minimum.
70 watts, maximum.
D. Protection: Line fuse (#81 lamp).
Bias fuse (#49 lamp).

II. TUBE-TEST POTENTIALS:

A. Plate Voltages: 75 and 150 volts D. C.
B. Screen Voltages: 56 and 130 volts D. C.
C. Fixed Bias Voltages: 0 to -40 volts D. C., adjustable.
D. Extra Negative Voltage: -40 volts D. C.
E. Provisions for Self-Bias Tests.
F. Signal Voltages: 0. 25, 0. 5, 1. 25, 2. 5 volts A. C.; 60 cycles.
G. Diode Test Voltage: 20 volts RMS.
H. V. R. Tube Test Voltages: 0-200 volts D. C., adjustable.
I. OZ4 Test Voltage: 287 volts RMS.
J. Filament Voltages: 0-117 volts A. C. (18 steps).

III. TEST METER:

A. Mutual Conductance Ranges: 0-1500/3000/6000/15,000/30,000 μmhos.
(Readings obtained from basic 0-1500 Gm scale and multiplier switch).
B. V. R. Test Scales: 0-200 volts D. C.
0-100 milliamperes.
C. Leakage Scale: Calibrated in Ohms.

IV. TUBE COMPLEMENT:

Quantity	Type
1 ea.	83
1 ea.	5Y3

V. PHYSICAL SPECIFICATIONS:

A. Height: $7\frac{1}{2}$"
B. Width: 18-3/8"
C. Depth: 16-3/4"
D. Weight: 25 lbs.
E. Case: Portable, Black Leatherette Covered.

CHAPTER II - OPERATING INSTRUCTIONS

Section 2-1: Panel Components; Identification and Function.

See Figure 1 to locate the various panel components referred to in this section. The functions of these components are described as follows:

A. The Controls:

1. The POWER ON-OFF switch controls power input to Model 752A.

2. The LINE ADJUST controls the input voltage to the power transformer for proper standardization of test potentials applied to the tube under test.

3. The FILAMENT VOLTAGE switch provides an 18-step selection of filament or heater voltages from 0.6 volts through 117 volts A.C. An OFF position is also provided for use when testing V.R. tubes and cold cathode rectifiers.

4. Selector switches, FILAMENT (2 ea), GRID A, GRID B, PLATE, SCREEN, CATHODE, and SUPPRESSOR, provide proper switching of the internal circuits to apply the correct test potentials to the various pins of the tube under test.

5. The BIAS control is used to adjust the bias voltage applied to the tube under test.

6. The SHUNT control is a dual potentiometer used to adjust the sensitivity of the meter circuit to the proper level required for testing rectifier and detector type diodes.

7. The MULTIPLIER switch is used to select the proper meter range for the particular type of tube under test. For mutual conductance tests, the MULTIPLIER switch is set to the X1, X2, X4, X10, or X20 position. This extends the full scale range of the basic 0-1500 micromho scale to 3000, 6000, 15,000, and 30,000 micromhos respectively. For controlled emission tests on rectifier and detector type diodes, the MULTIPLIER switch is set to the SH or shunt position. This connects the SHUNT potentiometer into the circuit, and this control should then be set to the value indicated on the roll chart. For voltage regulator tests, the MULTIPLIER switch is set to the VR position. In the VR position the test meter becomes a 0-200 VDC voltmeter, and when S-9 is depressed the test meter becomes a 0-100 milliammeter.

8. The LEAKAGE switch, when rotated through positions 1, 2, 3, 4, 5, and 6, connects the various elements of the tube under test across a test voltage. In certain positions of the LEAKAGE switch, tubes having interelement leakage paths will complete the test circuit and cause the pointer of the test meter to move up scale.

9. The ten push-button switches located in the lower righthand portion of the panel actuate the proper test circuit, as indicated on the roll chart. Their designation and function is as follows:

   a. S1 - DIODE - used when testing low-power diodes, such as the 6H6.
   b. S2 - 0Z4 - used when testing cold cathode rectifiers, such as the 0Z4.
   c. S3 - RECT. - used when testing rectifiers, such as the 5Y3, 6X4, etc.
   d. S4 - LOW PLT. - used when testing amplifier type tubes such as the 1R5 and 1S4.

e. S5 - RED GM push-button for mutual conductance test on amplifier tubes only. NEVER USE THIS BUTTON WHEN TESTING RECTIFIER TUBES.
f. S6 - GAS #1 and S7 - GAS #2 - used when making gas test on amplifier tubes.
g. S8 - PLT #2 - used when testing multiunit tubes with electrically similar sections. By depressing S8, the test conditions are transferred from one section of the tube to the other; thus each section can be independently evaluated.
h. S9 - V. R. MILS - this switch converts the test meter into a 0-100 milliammeter during the V. R. tests.
i. S10 - LINE - used in conjunction with the LINE ADJUST control and LINE TEST point on the meter to standardize tube test potentials.

10. The VR VOLTAGE adjust is used to control the voltage applied to voltage regulator tubes during a VR test.

11. The LIFE TEST switch is used when making a reserve life test on a tube. When this switch is pressed the filament voltage of the tube under test is reduced by approximately 10% of its normal value. The efficiency of the cathode of the tube under test can then be evaluated and the future life of the tube approximated.

B. The TEST METER gives a quantitative indication of the tube-test results on three separate scales.

1. The LEAKAGE scale is calibrated in ohms. Interelement leakage paths up through 10 megohms can be measured.

2. The MICROMHOS scale is used to give a quantitative indication of the results of the Gm, Emission, and Gas tests. The range of the basic 0-1500 micromho scale is extended by use of the MULTIPLIER switch. The readings obtained on this scale, when compared with the recommended rejection values listed in the MINIMUM MUT. COND. column of the roll chart, are indicative of the performance capabilities of the tube under test.

3. The VOLTS-MILS scale is calibrated in D. C. volts and milliamperes. During V. R. tests, it indicates the striking, operating, and regulating voltage of the V. R. tube, along with the current range over which the tube is regulating.

C. The TEST SOCKETS are located along the upper edge of the panel and to the left of the test meter. The 15 tube sockets provided will accommodate the following tube-types: In-Line and 8 pin Subminiatures, Octal, Loktal, 7 pin Miniature, 4, 5, 6, and 7 pin Standard, Acorn, and 9/10 pin, 5 pin Nuvistor, 7 pin Nuvistor, Compactron and Novar

D. LEADS, LAMPS and CONNECTIONS:

1. Two TEST LEADS are provided to make connections from the G, P and K panel jacks to the top caps of tubes as required. When the leads are not in use, they can be stored in the lead compartment at the top of the case.

2. The LINE FUSE lamp serves both as a protective device and an overload indicator. This lamp will light brightly when an overload is placed on the tester or the tube under test. When this occurs turn OFF the equipment immediately. The LINE FUSE lamp (#81) is mounted in the upper lefthand portion of the main panel where it is readily visible.

3. The BIAS FUSE lamp is connected into the bias supply circuit. It serves as a

protection for the bias potentiometer in case an attempt is made to test a shorted tube. A burned out bias fuse lamp will result in the failure of the test meter to read when the Gm button is pressed. The BIAS FUSE lamp (#49) is mounted in the upper lefthand portion of the main panel where it is readily visible.

4. One red and two black jacks, marked P, G and K respectively, provide connections for the test leads necessary to test tubes with top cap connections.

5. The EXT. SELF BIAS RES. jacks provide the means of making self bias tests. IMPORTANT - the shorting link across the SELF BIAS terminals must be in place when these terminals are not in use.

E. TUBE TEST DATA:

1. All information necessary for properly setting the tube test controls for the various tube types is tabulated on the roll chart in nine columns under the following headings, reading from left to right:

   a. TUBE TYPE: All currently available type numbers for the tubes which the Model 752 is designed to test are listed numerically in this column starting with type 0A2 and continuing through type 9006.

   b. FILAMENT: Correct filament or heater voltages for the tube type to be tested are shown in this column. The FILAMENT VOLTAGE switch must be adjusted BEFORE inserting a tube in any of the test sockets.

   c. SELECTORS: The tube pin selectors FILAMENT (2 ea.), GRID A, GRID B, PLATE, SCREEN, CATHODE, and SUPPRESSOR are to be set in accordance with the two groups of four digit numbers appearing in this column. For example, the selector settings for the 12AT7 are listed as 4572-6183; the selectors are set as follows:

SELECTOR	POSITION NO.
FILAMENT	4
FILAMENT	5
GRID A	7
GRID B	2
PLATE	6
SCREEN	1
CATHODE	8
SUPPRESSOR	3

   d. BIAS: This column lists the proper settings for the BIAS dial which controls the bias voltage applied to the tube under test.

   e. SHUNT: This column lists the settings for the SHUNT dial which controls the sensitivity of the meter circuit. Adjustment of this dial is only required when the MULTIPLIER switch is in the SH position.

   f. MULT: This column lists the position to which the MULTIPLIER switch should be set to provide the proper meter range for the type of tube under test.

   g. PRESS: This column lists the proper push-button switches to be pressed to complete the various test circuits applicable to the tube under test.

h. MINIMUM MUT. COND: In this column are the minimum mutual conductance rejection values for amplifier tubes and amplifier sections of multi-purpose tubes. The rejection values for rectifier and detector type diodes are also listed in this volumn, along with the nominal operating voltage for V. R. tubes.

i. NOTATIONS: Listed in this column is special information applicable to the tube under test.

2. Incorporated into the instruction book is a section containing tube test data on obsolete tube types.

Section 2. 2: General Operating Procedures.

A. Preliminary procedures:

1. Remove the line cord from the lead compartment and connect its plug into an outlet supplying 105-125 volts A. C., 60 cycles. NEVER CONNECT THIS EQUIPMENT TO A D. C. POWER SOURCE.

CAUTION

DO NOT INSERT TUBE TO BE TESTED INTO TEST SOCKET UNTIL CORRECT SETTINGS OF ALL CONTROLS HAVE BEEN MADE IN ACCORDANCE WITH THE FOLLOWING STEPS.

2. Operate the thumb gear which turns the roll chart mechanism until the type number of the tube to be tested appears in the roll chart window. A red index line aids in selecting correct data line from the roll chart.

3. Turn the knob of the FILAMENT VOLTAGE switch to the voltage indicated on the roll chart under the heading FIL.

4. Set the eight tube pin selector switches in accordance with two groups of four digit numbers appearing in the column headed SELECTORS.

The selector switches are electrically interlocked in such a way that it is impossible to connect two different voltages to the same tube pin at the same time. Accidental shorts are thus avoided.

5. Set the BIAS dial to the numerical setting listed on the roll chart under the heading of BIAS.

6. Set the SHUNT dial to the numerical setting listed on the roll chart under the heading of SHUNT. If no setting of this dial is required, a short dotted line will appear in the column.

7. Set the MULTIPLIER switch to the position indicated on the roll chart.

8. Set the LEAKAGE switch to the TUBE TEST POSITION.

9. Insert the tube to be tested into the proper test socket, and if applicable make top cap connection as called for in NOTATIONS column of the roll chart.

10. Set the POWER ON-OFF switch to the ON position.

    NOTE: ALLOW SUFFICIENT TIME FOR THE TUBE UNDER TEST TO REACH ITS OPERATING TEMPERATURE BEFORE PROCEEDING.

11. LINE TEST: Depress push-button S10 and rotate the LINE ADJUST control until the test meter pointer indicates to the line marked "Line Test".

B. The LEAKAGE TEST procedures.

1. Rotate the LEAKAGE switch from position number 1 through position number 6, while tapping the tube lightly with your finger and watching the test meter for pointer deflection.

   Tubes having interelement shorts and leakage paths will cause the meter pointer to move up scale in various positions of the LEAKAGE switch. A momentary deflection of the test meter pointer when the LEAKAGE switch is turned from one position to the next should be disregarded. These meter pointer deflections are caused by the charging of a capacitor in the leakage test circuit. Intermittent meter pointer deflections as a result of tapping the tube indicates loose elements which might cause noisy or erratic tube operation.

   A leakage resistance of 10 megohms will cause the meter pointer to begin to indicate. A complete interelement short will cause the pointer to deflect full scale to give a zero ohms reading. The top scale of the meter is the LEAKAGE scale, and it is calibrated in ohms such that the resistance of leakage paths up to 10 megohms can be read directly from the scale.

2. A shorted tube or one with excessive interelement leakage should be discarded with no further testing.

3. Multisection tubes containing dissimilar sections, such as the 6CG8, should be tested for shorts and leakage on both sections.

4. Multisection tubes containing electrically similar sections, such as the 6J6, can make use of the DUAL TEST circuit.

   FOR EXAMPLE: For dual triodes make the normal leakage test as described in step 1 of part (B); then depress push-button S8 and repeat the leakage test for the second section.

5. Table No. 1: Leakage Test Chart, is to be used for identifying interelement leakage paths. In Table No. 1 an (X) under any LEAKAGE switch position represents a meter pointer deflection in that position; thus by referring to the Leakage Path column of Table No. 1 the defective elements can be identified.

6. The circuit used in testing dual triodes is such that the SCREEN selector is used as the plate of the second section, and the SUPPRESSOR selector is used as the cathode of the second section. Thus, plate to plate, and cathode to cathode shorts or leakages will be identified on the Leakage Test Chart as plate to screen, and cathode to suppressor shorts or leakages.

7. Some tubes will show a shorted condition on certain positions of the LEAKAGE switch even though they are good tubes. These positions are noted in the NOTATIONS column of the roll chart. That is, "Short on 1 and 2" means that a short indication on positions 1 and 2 is normal.

TABLE NO. I: LEAKAGE TEST CHART

LEAKAGE PATH	LEAKAGE SWITCH POSITIONS					
	1	2	3	4	5	6
HEATER - CATHODE	X	X				
HEATER - GRID A			X	X	X	
HEATER - GRID B			X	X	X	X
HEATER - SCREEN			X			
HEATER - SUPPR.		X				
HEATER - PLATE			X	X		
CATH. - GRID A	X	X	X	X	X	
CATH. - GRID B	X	X	X	X	X	X
CATH. - SCREEN	X	X	X			
CATH. - SUPPR.	X					
CATH. - PLATE	X	X	X	X		
GRID A - GRID B						X
GRID A - SCREEN				X	X	
GRID A - SUPPR.		X	X	X	X	
GRID A - PLATE					X	
GRID B - SCREEN				X	X	X
GRID B - SUPPR.		X	X	X	X	X
GRID B - PLATE					X	X
SCREEN - SUPPR.		X	X			
SCREEN - PLATE				X		
SUPPR. - PLATE		X	X	X		

C. MUTUAL CONDUCTANCE (Gm) Test: This is the basic quality test for tubes used as amplifiers. After the controls are properly set in accordance with the roll chart data as outlined in Part A of this section, and the tube has been tested for leakage in accordance with Part B of this section, proceed as follows:

1. Set the LEAKAGE switch to the TUBE TEST position.

2. Recheck LINE ADJUST TEST and reset if necessary.

3. Press the Gm push-button S5 and observe the test meter indication.

4. Compare the numerical value of the meter reading on the 0-1500 scale with the minimum acceptable value listed on the roll chart under the column headed MINIMUM MUT. COND.

5. The meter reading can be read directly in micromhos through the use of the MULTIPLIER setting and the basic 0-1500 micromho scale.

   NOTE: On special types of amplifier tubes the push-buttons to be used may vary with the particular tube type under test. Always refer to the roll chart for the correct push-buttons to use.

D. GAS TEST: The push buttons S6 and S7 are used to test an amplifier tube for gas content. After the tube under test has been tested for Gm proceed as follows:

1. Set the MULTIPLIER switch to the X2 position. This extends the Micromho Scale to the 0-3000 micromho range.

2. Turn the BIAS dial full clockwise to indicate 100.

3. Depress push-button S6 and hold in the down position while adjusting the BIAS dial until the pointer of the meter indicates 100 micromhos on the 0-3000 range.

4. Hold down S6 and depress push-button S7 while observing the meter pointer.

5. If the tube contains gas the pointer of the meter will move up scale. If the pointer movement is not more than two small scale divisions the gas content is negligible.

6. With some tubes, such as the Type 45, the micromho reading cannot be brought down to 100 micromhos by turning the BIAS dial. In such cases turn the BIAS dial clockwise to 100. Test for gas by noting whether the pointer moves more than two divisions up scale when S6 is held down and S7 is depressed.

7. Some tubes will give an indication of gas only after they have been operating for a period of time. If a tube is suspected of being gassy, allow it to heat for a few minutes.

E. RESERVE LIFE TEST: This test is used to approximate the future life of the tube. After the mutual conductance test has been made as previously described, proceed as follows:

1. Set the MULTIPLIER switch to the SH position.

2. Turn the SHUNT dial full clockwise to indicate 100.

3. Depress push-button S5 and hold in down position while adjusting the SHUNT dial until the meter pointer indicates to 1000 on the 0-1500 scale.

4. Hold down S5 and depress the LIFE TEST switch. This switch reduces the filament voltage applied to the tube under test.

5. If the meter reading remains above mid-scale, the reserve life of the tube under test may be considered satisfactory.

F. RECTIFIER TUBE TEST: Rectifier tubes, including diode tubes and diode sections of multisection tubes, are tested for emission characteristics since they have no mutual conductance characteristic. The push-button switches S1, S2, and S3 are used to test various types of rectifiers and detector diodes.

1. The push-button switch S1 is used when testing detector diodes. This switch applies a test voltage sufficiently low in magnitude so as not to damage the delicate cathode of the diode under test.

2. The push-button S2 is used when testing cold cathode rectifiers such as the 0Z4. This switch applies a test voltage sufficiently high to ionize the tube and start conduction.

3. The push-button S3 is used when testing rectifier tubes such as 5Y3. This switch applies a test voltage of sufficient magnitude to reveal the defects in this type of tube.

G. DUAL TEST: For multisection tubes containing electrically similar sections, the notation DUAL TRIODE or DUAL DIODE will appear in the NOTATIONS column of the roll chart. When the dual test is called for, the following procedure is applicable.

1. DUAL TRIODE: After the controls are properly set in accordance with the roll chart data as outlined in Part A of this section, proceed as follows.

   a. Rotate the LEAKAGE switch from position number 1 through position number 6 and observe the test meter for indications of leakage paths.

   b. Depress push-button S8 and repeat the leakage test for the second section of the tube.

   c. Set the LEAKAGE switch to the TUBE TEST position.

   d. Depress push-button S5 - Gm, and observe the test meter for an indication of the Gm of the first section. Release S5.

   e. A Gas Test for the first section should be performed as described in Part D of this section.

   f. After the first section has been completely tested, depress push-button S8 and hold in down position while S5 is again depressed and the second section of the tube under test is checked for Gm.

   h. During testing of each section of a dual triode, the grid of the unused section is kept at cut-off bias by the extra negative bias supply.

2. DUAL DIODE: The testing of dual diodes is performed as described above with two exceptions.

a. The diode test push-button (S1, S2, or S3) as called for in the PRESS column of the roll chart is to be used in conjunction with S8.

b. The Gas Test is not applicable to diodes and rectifiers.

H. SPECIAL TUBE TYPES:

1. Voltage Regulator Tubes: The voltage regulator test circuit permits the testing of V. R. tubes under actual operating conditions. The V. R. test circuit measures the voltage drop across the tube under test; hence the striking voltage and the voltage drop for minimum and maximum load currents can be read directly in volts on the test meter.

With the MULTIPLIER switch in the VR position, the VR VOLTAGE dial controls the magnitude of the test voltage applied to the tube. The push-button switch S9 converts the test meter from a voltmeter to a milliammeter. The bottom scale of the meter is used to evaluate the results of the V. R. test. This scale is calibrated in VOLTS (0-200 v. d. c.) and MILS (0-100 ma. dc.).

The test data for V.R. tubes will be found at the beginning of the left hand column of the roll chart.

For example, the 0A3:

a. Set the FILAMENT voltage switch to the OFF position.

b. Set the tube pin selector switches to 0000-5020.

c. Set the MULTIPLIER switch to the VR position.

d. Turn the VR VOLTAGE control fully counter-clockwise.

e. Turn the LINE ADJUST control fully clockwise.

f. Insert the 0A3 into its proper test socket and turn the tester ON.

g. In the NOTATIONS column for the 0A3 is the voltage value 100V with a star in front of it. This notation represents the approximate starting voltage for the VR tube. In the column MINIMUM MUT. COND. is the voltage value 75V. This represents the nominal operating voltage for the VR tube.

h. Rotate the VR VOLTAGE control slowly clockwise. The meter pointer should begin to indicate. The voltage value is read on the 0-200 volts scale.

i. When the meter indicates approximately 100 volts, the tube should fire. This will cause the meter pointer to hesitate and drop back to the operating voltage value of the tube under test. In the case of the 0A3, it is 75V.

j. Depress push-button S9 - V. R. MILS. This converts the test meter from a voltmeter to a milliammeter, and it should indicate approximately 5 MA on the 0-100 MILS scale.

k. While holding S9 in the down position continue to rotate the VR VOLTAGE control clockwise until the test meter indicates 40 MA.

l. Release S9 and read the voltage indicated on the test meter. For a good 0A3

the operating voltage should not have risen more than 5 volts above the nominal operating voltage.

2. Certain pentode tubes, such as the 6AJ5, require a low screen voltage and a normal plate voltage during test. This is accomplished by holding down S1 and pressing S5. When applicable, a note is printed on the roll chart under the heading of NOTATIONS: HOLD DOWN S1 AND PRESS S5.

3. Cathode-Ray Tube Test. With the use of the Hickok CRT Adapter, magnetic or electrostatic type T.V. picture tubes having a small shell duo-decal base can be given an interelement leakage test, a cathode emission test, a control grid test, and a gas test.

   a. Preliminary Instructions.

      (1) Remove the socket from the cathode-ray tube to be tested.
      (2) Affix the CRT Adapter to the tube to be tested.
      (3) Attach the red lead to the No. 2 anode of the tube under test.
      (4) Insert the 8 pin plug on the cable of the CRT Adapter into the octal tube test socket on the main panel of the Model 752A.

   b. Cathode Emission Test.

      (1) Set the selectors and dials as follows:

FIL	SELECTORS	BIAS	SHUNT	MULT	PRESS	MINIMUM MUT. COND.
6.3	7230-5084	0	75	SH	S1	650

      (2) Make an interelement leakage test by rotating the LEAKAGE switch through positions 1 thru 6.
      (3) Set the LEAKAGE switch to the TUBE TEST position.
      (4) Depress S1 and observe the test meter indication. A good tube should read above the recommended reject value noted above.

   c. Grid Control and Gas Test.

      (1) Set the selectors and dials as follows:

FIL	SELECTORS	BIAS	SHUNT	MULT	PRESS
6.3	7250-3084	*	0	SH	S6

      (2) Make an interelement leakage test as described above.
      (3) Set the LEAKAGE switch to the TUBE TEST position.
      (4) * Hold down S6 and rotate the bias dial. If the control grid is functioning, the meter pointer will move up and down scale.

      (5) Gas Test: Adjust Bias control until the test meter reads one small scale division. Hold down S6 and depress S7.

      If the meter pointer moves up-scale more than one division, the tube is gassy.

The Hickok CRT Adapter (Code No. 3122-73) is available through Hickok Distributors.

PARTS LIST FOR MODEL 752A TUBE TESTER
NOTE: There is a minimum billing charge of $3. 50 for any one parts order
Prices will be furnished upon request.

Ref. Symbol	Name and Description	Hickok Code No.
	BOOKLET: instruction	2490-411
	BUTTON: push, black	2920-7
	BUTTON: push, red	2920-8
	BUTTON: push, yellow	2920-13
C1	CAPACITOR: mica, 2700 mmfd., 500V	3095-41
C2	CAPACITOR: plastic, 0. 5 mfd., 200 V	3105-206
C3	CAPACITOR: plastic, 0. 1 mfd., 200 V	3105-210
C4	CAPACITOR: electrolytic, 8 mfd., 350 V	3085-68
C5	CAPACITOR: electrolytic, 50 mfd., 6 V	3085-45
	CASE: carrying	3145-494
	CHART: data roll	3200-71
CR1	RECTIFIER: full wave, copper oxide	18150-42
CR2	CRYSTAL: SD 91	3870-41
Shunt	DIAL ASSEMBLY: Shunt	4160-66
Bias	DIAL ASSEMBLY: Bias	4160-67
	INDEX ROLLER ASSEMBLY	9600-42
Plate	JACK: pin plug type, red.	10300-47
Grid, Cath.	JACK: pin plug type, black	10300-48
	KNOB: phenolic, black	11505-55
Line Fuse	LAMP: #81 Auto - Tungsol, bayonet base	12270-2
Bias Fuse	LAMP: #49 pilot, bayonet base	12270-17
Pilot	LAMP: #47 G. E., bayonet base	12270-12
	LEAD ASSEMBLY:	12450-145
	LEAD ASSEMBLY:	12450-180
M1	METER: Model 68	680-045
R1	RESISTOR: 100 ohms, 10%, center tapped	18575-19
R2	RESISTOR: 215K ohms, 1%, 1/2 watt	18537-61
R3	RESISTOR: 270 ohms, 5%, 1/2 watt	18411-271
R4		
R5	POTENTIOMETER: 50K ohms	16925-255
R6	RESISTOR: 200 ohms, 1%, 2 Watt	18540-5
R7	RESISTOR: same as R1	
R8	RESISTOR: 180K ohms, 10%, 1/2 watt	18414-182
R9	RESISTOR: 2 megohm, 5%, 1/2 watt	18415-201
R10	POTENTIOMETER: 500 ohms	16925-376
R11	RESISTOR: 470K ohms, 1%, 1/2 watt	18537-66
R12	RESISTOR: 470 ohms, 5%, 2 watt	18431-471
R13	RESISTOR: 10 ohms, spool type	18670-105
R14	RHEOSTAT: 10K ohms, 50 watt	18750-26
R15	RESISTOR: 2. 92K ohms	18537-67
R16	RESISTOR: 1200 ohms, 10%, 1 watt	18422-122
R17	RESISTOR: 1800 ohms, 10%, 10 watt	18575-12
R18	RHEOSTAT: 200 ohms, 25 watt	18750-2
R19	RESISTOR: 12 ohms, 1%, 1/2 watt	18537-59
R20	POTENTIOMETER: 50 ohms	16925-271
R21	RESISTOR: 119 ohms, 1%, 1/2 watt	18537-62
R22	RESISTOR: 47 ohms, 10%, 1/2 watt	18410-472
R23	RESISTOR: 41 ohms, 1%, 1/2 watt	18537-60
R24	RESISTOR: Same as R23	
R25	RESISTOR: 15K ohms, 5%, 1 watt	18423-151
R26	RESISTOR: Same as R21	
R27	RESISTOR: 8500 ohms, 10%, 10 watt	18575-89
R28	POTENTIOMETER: 3000 ohms	16926-5

PARTS LIST FOR MODEL 752A TUBE TESTER

NOTE: There is a minimum billing charge of $3. 50 for any one parts order. Prices will be furnished upon request.

Ref. Symbol	Name and Description	Hickok Code No.
R29, 30	POTENTIOMETER: 150-150 ohms, dual linear, Mallory #MM150P	16925-90
R31	RESISTOR: 500 ohms, 1%, 1/2 watt	18537-58
R32	RESISTOR: 250 ohms, 1%, 1/2 watt	18537-63
R33	RESISTOR: 150 ohms, 1%, 1/2 watt	18537-64
R34, 35	RESISTOR: 50 ohms, 1%, 1/2 watt	18537-65
R36	RESISTOR: 200K ohms, 1%, 1/2 watt	18537-46
R37	RESISTOR: 1000 ohms, 1/2 watt	18412-102
T1	TRANSFORMER: power	20800-224
V1	TUBE: #83 rectifier	20875-28
V2	TUBE: #5Y3GT/G	20875-6
Pilot	SOCKET ASSEMBLY: panel light	19350-112
Line Fuse	SOCKET: bayonet, small	19350-1
Bias Fuse	SOCKET: bayonet, miniature	19350-203
	SOCKET: 4 pin, Amphenol #78-S4M	19350-93
	SOCKET: 5 pin, Amphenol #78-S5M	19350-94
	SOCKET: 6 pin, Amphenol #78-S6M	19350-95
	SOCKET: 7 pin, Amphenol #78-7CDM	19350-96
	SOCKET: 8 pin, loctal, Amphenol #78-8LM	19350-97
	SOCKET: 8 pin, octal, Amphenol #78-S8M	19350-99
	SOCKET: 7 pin, Amphenol #147-504	19350-136
	SOCKET: Acorn, 7 contact, Alden #457V1M	19350-43
	SOCKET: Nuvistor, 5 pin	19350-381
	SOCKET: Nuvistor, 7 pin	19350-383
	SOCKET: 9 pin, Cinch	19350-367
	SOCKET: 10 pin	19350-364
	SOCKET: combination, 7-8 pin	19350-220
	SOCKET: compactron	19350-365
	SOCKET: wafer, octal, Cinch #11961	19350-156
	SOCKET: wafer, 4 pin, Cinch #X154	19350-157
Life Test	SWITCH: push button, D. P. D. T., Oak type 175	19910-118
S1 thru S10	SWITCH: push type, 10 button, Oak type 130	19910-132
ON-OFF	SWITCH: toggle, S. P. S. T., A. H. & H. #20994-DA	19911-9
Filament Volts	SWITCH: rotary, 2 section, 3 pole, 20 position, Oak type MF24	19912-386
Tube Pin Selectors Nos. 1 thru 6	SWITCH: rotary, 1 section, interlocking, 14 position, Oak Mfg. Co.	19912-477
Tube Pin Selectors Nos. 7 & 8	SWITCH: rotary, 1 section, 14 position, Oak type CK14	19912-469
Leakage	SWITCH: rotary, 5 section, 7 position, Oak type CK14	19912-373
Multiplier	SWITCH: rotary, 5 section, 7 position, Oak type H.	19912-374

TESTING GERMANIUM DIODES
ON THE MODEL 752A TUBE TESTER

Two tests only are made on these diodes in the following order:

1. Forward conduction and rectification.
2. Reverse conduction.

For the Forward Conduction and Rectification test connect the cathode end of the diode to the octal test socket pin No. 3 and connect the other end to the octal test socket pin No. 6. The grid and plate leads supplied with the tester may be used for these connections. If the meter reads backwards, reverse the diode. The diode will then be properly connected for the Reverse Conduction test also.

TUBE	FIL	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.	NOTATIONS
1N34	OFF	0000-6030	100	60	SH	S3	650	Forward Conduction and Rectification
1N34	OFF	0060-3000	100	0	SH	S1	---	Reverse Conduction
1N34 is OK if reading is less than 300.								
1N38	OFF	0000-6030	100	67	SH	S3	650	Forward Conduction and Rectification
1N38	OFF	0060-3000	100	0	SH	S1	---	Reverse Conduction
1N38 is OK if reading is less than 125.								
1N48	OFF	0000-6030	100	67	SH	S3	650	Forward Conduction and Rectification
1N48	OFF	0060-3000	100	0	SH	S1	---	Reverse Conduction
1N48 is OK if reading is less than 550.								
1N91	OFF	0000-6030	100	68	SH	S3	650	Forward Conduction and Rectification
1N91	OFF	0060-3000	100	0	SH	S1	---	Reverse Conduction
1N91 is OK if reading is less than 750.								
1N93	OFF	0000-6030	100	69	SH	S3	650	Forward Conduction and Rectification
1N93	OFF	0060-3000	100	0	SH	S1	---	Reverse Conduction
1N93 is OK if reading is less than 125.								

MODEL 752A

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.		NOTATIONS
1A4	2.0	4100-2300	18	---	X2	---	225		CAP=G. Hold down S1 and Press S5
1A6	2.0	6100-2504	12	---	X2	---	225		Pent. Sect. CAP = G Hold down S1 and Press S5
1A6	2.0	6140-3502	25	---	X1	S5	125		Osc. Sect.
1AB5	1.1	8160-2300	0	---	X2	S5	375		
1B5	2.0	6150-2000	10	---	X1	S5	350		Triode Sect.
1B5	2.0	6100-4300	0	40	SH	S1	400	X	Dual Diode
1B7	1.4	7200-3405	4	---	X2	---	300		Pent. Sect. CAP = G Hold down S1 and Press S5
1B7	1.4	7250-6403	17	---	X2	---	200		Osc. Sect. Hold down S1 and Press S5
1C6	2.0	6100-2534	13	---	X2	---	250		Ampl. Sect. CAP = G Hold down S1 and Press S5
1C6	2.0	6140-3520	28	---	X1	S5	150		Osc. Sect.
1C7	2.0	7200-3465	13	---	X2	---	250		Pent. Sect. CAP = G Hold down S1 and Press S5
1C7	2.0	7250-6430	28	---	X1	S5	150		Osc. Sect.
1C8	1.1	4520-7608	40	---	X1	S5	175		
1D7	2.0	7200-3465	12	---	X2	---	225		Pent. Sect. CAP = G Hold down S1 and Press S5
1D7	2.0	7250-6430	25	---	X1	S5	125		Osc. Sect.
1D8	1.4	7250-3460	18	---	X2	---	275		Pent. Sect. Hold down S1 and Press S5
1D8	1.4	7200-6000	0	---	X1	S5	350		Triode Sect. CAP = G
1D8	1.4	7200-8000	0	0	SH	S1	400		Diode Sect.
1E4	1.4	7250-3000	25	---	X2	S5	375		
1E5	2.0	7200-3400	15	---	X1	S5	400		CAP = G
1E7	2.0	7250-6834	11	---	X2	S5	350		Pent. No. 1
1E7	2.0	7240-3865	11	---	X2	S5	350		Pent. No. 2
1F4	2.0	5130-2400	22	---	X2	S5	425		
1F5	2.0	7250-3400	22	---	X2	S5	425		
1F6	2.0	6100-2300	8	---	X2	---	200		Pent. Sect. CAP = G Hold down S1 and Press S5
1F6	2.0	6100-5400	8	0	SH	S1	400	X	Dual Diode
1F7	2.0	7200-3600	8	---	X2	---	200		Pent. Sect. CAP = G Hold down S1 and Press S5
1F7	2.0	7200-4530	8	0	SH	S1	400	X	Dual Diode
1G4	1.4	7250-3000	48	---	X2	S5	250		
1G5	2.0	7250-3040	16	---	X2	---	475		Hold down S1 and Press S5
1G6	1.4	7254-6300	19	---	X2	S5	200	X	Dual Triode
1H4	2.0	7250-3000	40	---	X2	S5	275		
1J5	2.0	7250-3400	46	---	X2	S5	300		
1J6	2.0	7254-6300	23	---	X2	S5	300	X	Dual Triode
1LB6	1.4	8160-2437	Use this setting for Short Check only						
1LB6	1.4	8160-3574	22	---	X1	S5	300		
1N6	1.4	7250-3400	40	---	X2	S5	250		Pentode Sect.
1N6	1.4	7200-6000	0	0	SH	S1	400		Diode Sect.
1P5	1.4	7200-3400	12	---	X2	S5	250		CAP = G
1R4	1.4	8100-4070	0	48	SH	S1	400		

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.	NOTATIONS
1SA6	1.4	7240-8630	0	---	X2	---	250	Hold down S1 and Press S5
1SB6	1.4	7280-3400	12	---	X1	S5	400	Pentode Sect.
1SB6	1.4	7280-5000	0	0	SH	S1	400	Diode Sect.
1T5	1.4	7250-3400	44	---	X2	S5	350	
2A4	2.5	7250-3000	#	93	SH	S6	650	Strikes at about 44
2A5	2.5	6140-2350	23	---	X2	S5	625	
2A6	2.5	6100-2050	11	---	X4	S5	175	Triode Sect. CAP = G
2A6	2.5	6100-4350	11	32	SH	S1	400	X Dual Diode
2A7	2.5	7100-2365	0	---	X2	S4	300	Pent. Sect. CAP = G
2A7	2.5	7150-4362	22	---	X1	S5	225	Osc. Sect.
2B4	2.5	5130-2040	#	93	SH	S6	650	Strikes at about 58
2B6	2.5	7140-2360	18	---	X2	S5	475	
2B22	6.3	7200-0080	0	30	SH	S3	650	Top Washer = P
2C4	2.5	7130-5040	#	93	SH	S6	650	Strikes at about 72
2C22	6.3	7200-0080	23	---	X4	S5	475	Far CAP = G Near CAP = P
2C26	6.3	7200-0080	13	---	X2	S5	550	Right CAP = P Left CAP = G
2C40	6.3	7200-0080	20	---	X4	S5	425	CAP = P. Ring = G
2E5	2.5	6150-4030	0	100	SH	S5	---	Eye Open
2E5	2.5	6150-4230	0	100	SH	S5	---	Eye Closed
2V3	2.5	7200-0000	0	78	SH	S6	650	CAP = P
2W3	2.5	8200-4000	0	0	SH	S3	400	
2Z2	2.5	4100-2000	0	0	SH	S3	400	
3A8	2.5	7200-3400	17	---	X2	S5	225	Pentode Sect. CAP = G
3A8	2.5	7250-6000	0	---	X1	S5	175	Triode Sect.
3A8	2.5	7200-8000	0	32	SH	S1	400	Diode Sect.
3B5	2.5	7250-3400	33	---	X2	S4	425	
3B7	2.5	1860-7000	27	---	X2	S5	475	Triode No. 1
3B7	2.5	8130-2000	27	---	X2	S5	475	Triode No. 2
3C6	2.5	1850-6000	10	---	X2	S4	350	Triode No. 1
3C6	2.5	8140-3000	10	---	X2	S4	350	Triode No. 2
5AX4	5.0	8200-6000	0	36	SH	S3	400	Plate No. 1
5AX4	5.0	8200-4000	0	27	SH	S3	400	Plate No. 2
5X3	5.0	4100-3000	0	34	SH	S3	400	Plate No. 1
5X3	5.0	4100-2000	0	20	SH	S3	400	Plate No. 2
6A4	6.3	5130-2400	28	---	X2	S5	625	
6AB5	6.3	6150-4030	0	100	SH	S5	---	Eye Open
6AB5	6.3	6150-4230	0	100	SH	S5	---	Eye Closed
6AB6	6.3	7250-3480	0	---	X2	S5	450	
6AC6	6.3	7250-3480	0	---	X2	S5	750	
6AD6	6.3	7240-3580	0	100	SH	S5	---	Eye 1 Open, Eye 2 Closed
6AD6	6.3	7230-4580	0	100	SH	S5	---	Eye 2 Open, Eye 1 Closed
6AE5	6.3	7250-3080	72	---	X2	S5	375	
6AE6	6.3	7250-4083	0	---	X2	S5	225	Triode No. 1
6AE6	6.3	7250-3084	0	---	X2	S5	250	Triode No. 2
6AE7	6.3	7260-3084	33	---	X2	S5	475	Triode No. 1
6AE7	6.3	7240-3056	33	---	X2	S5	475	Triode No. 2
6AF5	6.3	7250-3080	52	---	X2	S5	475	

MODEL 752A

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.	NOTATIONS
6AH5	6.3	7260-4½80	17	---	X10	S5	300	
6AJ7	6.3	7240-8653	15	---	X10	S5	375	
6AK7	6.3	7240-8651	12	---	X10	S5	475	
6AW7	6.3	7820-6010	10	---	X4	S5	175	Triode Sect.
6AW7	6.3	7800-3451	0	76	SH	S1	400	X Dual Diode
6AX6	6.3	7200-5384	0	58	SH	S3	650	X Dual Diode
6B5	6.3	6140-2350	0	---	X2	S5	525	
6B6	6.3	7200-3080	11	---	X4	S5	175	Triode Sect. CAP = G
6B6	6.3	7200-5480	11	32	SH	S1	400	X Dual Diode
6B8	6.3	7200-3681	22	---	X2	S5	300	Pent. Sect. CAP = G
6B8	6.3	7200-5481	22	32	SH	S1	400	X Dual Diode
6C7	6.3	7100-2060	26	---	X2	S5	375	Triode Sect. CAP = G
6C7	6.3	7100-5460	26	30	SH	S1	400	X Dual Diode
6C8	6.3	7205-3648	15	---	X2	S5	500	X Dual Triode. CAP = G
6D5	6.3	7250-3080	57	---	X2	S5	625	
6D7	6.3	7100-2364	21	---	X2	S5	375	CAP = G
6D8	6.3	7200-3485	0	---	X2	S4	300	Pent. Sect. CAP = G
6D8	6.3	7250-6483	22	---	X1	S5	225	Osc. Sect.
6E6	6.3	7153-6240	51	---	X2	S5	425	X Dual Triode
6E7	6.3	7100-2364	17	---	X2	S5	500	CAP = G
6G5	6.3	6150-4030	0	100	SH	S5	---	Eye Open
6G5	6.3	6150-4230	0	100	SH	S5	---	Eye Closed
6H4	6.3	7200-4080	0	73	SH	S1	400	
6K5	6.3	7200-3080	15	---	X4	S5	225	CAP = G
6N5	6.3	6150-4030	0	100	SH	S5	---	Eye Open
6N5	6.3	6150-4230	0	100	SH	S5	---	Eye Closed
6N6	6.3	7250-3480	0	---	X2	S5	525	
6P7	6.3	2300-4586	18	---	X2	S5	350	Pent.Sect. CAP = G
6P7	6.3	2370-6084	35	---	X2	S5	150	Triode Sect.
6Q6	6.3	7200-3080	13	---	X2	S5	300	Triode Sect. CAP = G
6Q6	6.3	7200-5480	13	30	SH	S1	400	X Dual Diode
6SZ7	6.3	7820-6031	15	---	X4	S5	175	Triode Sect.
6SZ7	6.3	7800-5431	0	30	SH	S1	400	X Dual Diode
6T5	6.3	6150-4030	0	100	SH	S5	---	Eye Open
6T5	6.3	6150-4230	0	100	SH	S5	---	Eye Closed
6T7	6.3	7200-3080	13	---	X2	S5	300	Triode Sect. CAP = G
6T7	6.3	7200-5480	13	30	SH	S1	400	X Dual Diode
6U7	6.3	7200-3485	17	---	X2	S5	500	CAP = G
6V7	6.3	7200-3080	42	---	X2	S5	300	Triode Sect. CAP = G
6V7	6.3	7200-5480	42	30	SH	S1	400	X Dual Diode
6W5	6.3	7200-5380	0	20	SH	S3	650	X Dual Diode
6W7	6.3	7200-3485	21	---	X2	S5	375	CAP = G
6Y5	6.3	6100-5340	0	58	SH	S3	650	X Dual Diode
6Y7	6.3	7254-6380	13	---	X2	S5	300	X Dual Triode
6Z7	6.3	7254-6380	14	---	X2	S5	375	X Dual Triode
7AB7	6.3	7250-3140	10	---	X4	S5	250	
7AJ7	6.3	8160-2374	8	---	X4	S5	350	
7B5	6.3	8160-2370	17	---	X4	S5	375	
7B6	6.3	8130-2070	11	---	X4	S5	175	Triode Sect.
7B6	6.3	8100-6572	0	30	SH	S1	400	X Dual Diode

MODEL 752A

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.	NOTATIONS
7B8	6.3	8160-2574	0	---	X2	S4	300	Pent. Sect.
7B8	6.3	8140-3576	22	---	X1	S5	225	Osc. Sect.
7C4	6.3	8100-4070	0	70	SH	S1	400	
7G8	6.3	8150-7362	11	---	X4	S5	325	Tetrode No. 1
7G8	6.3	8140-2367	11	---	X4	S5	325	Tetrode No. 2
7S7	6.3	8160-2574	16	---	X2	S5	475	Heptode Sect.
7S7	6.3	8140-3075	14	---	X2	S5	525	Triode Sect.
7T7	6.3	8160-2374	10	---	X4	S5	475	
10	7.5	4130-2000	44	---	X2	S5	375	
10Y	7.5	4130-2000	44	---	X2	S5	375	
12A	5.0	4130-2000	48	---	X2	S5	525	
12A5	12.6	7140-2350	38	---	X2	S5	550	
12A6	12.6	7250-3481	18	---	X4	S5	475	
12B8	12.6	7200-3410	18	---	X4	S5	275	Pent. Sect. CAP = G
12B8	12.6	7280-5060	7	---	X4	S5	300	Triode Sect.
12F5	12.6	7200-4080	12	---	X4	S5	225	CAP = G
12SW7	12.6	7820-6031	21	---	X2	S5	600	Triode Sect.
12SW7	12.6	7800-5436	0	30	SH	S1	400	X Dual Diode
12SX7	12.6	7841-5263	23	---	X4	S5	400	X Dual Triode
12SY7	12.6	7280-3465	10	---	X4	---	150	Ampl. Sect. Hold down S1 and Press S5
12SY7	12.6	7250-4068	22	---	X4	S5	625	Osc. Sect.
12Z3	12.6	4100-2030	0	35	SH	S3	650	
12Z5	6.3	6100-5040	0	30	SH	S3	650	Plate No. 1
12Z5	6.3	2100-3040	0	30	SH	S3	650	Plate No. 2
14A4	12.6	8160-2070	23	---	X4	S5	400	
14A5	12.6	8160-2370	18	---	X4	S5	475	
14E7	12.6	8160-2570	20	---	X4	S5	200	Pent. Sect.
14E7	12.6	8100-4372	0	30	SH	S1	400	X Dual Diode
14Z3	12.6	4100-2030	0	35	SH	S3	650	
15	2.0	5100-2340	0	---	X2	---	225	CAP = G. Hold down S1 and Press S5
19	2.0	6143-5200	23	---	X2	S5	300	X Dual Triode
RK20A	7.5	5130-0240	0	---	X2	S5	625	CAP = P
22	3.0	4100-2300	0	---	X1	S5	300	CAP = G
24A	2.5	5100-2340	25	---	X2	S5	300	CAP = G
VT25A	7.5	4130-2000	44	---	X2	S5	375	
25A7	25.0	7250-3486	32	---	X2	S5	550	Pent. Sect.
25A7	25.0	7200-6013	0	40	SH	S3	650	Rect. Sect.
25AC5	25.0	7250-3080	0	---	X2	S5	475	
25B5	25.0	6140-2350	0	---	X2	S5	625	
25B6	25.0	7250-3480	20	---	X10	S4	300	
25B8	25.0	7200-3410	18	---	X4	S5	275	Pent. Sect. CAP = G
25B8	25.0	7280-5060	7	---	X4	S5	300	Triode Sect.
25D8	25.0	7200-3410	18	---	X4	S5	300	Pent. Sect. CAP = G
25D8	25.0	7250-6010	12	---	X4	S5	175	Triode Sect.
25D8	25.0	7200-8010	12	53	SH	S1	400	Diode Sect.

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT. COND.		NOTATIONS
25N6	25.0	7250-3480	0	---	X2	S5	625		
25T	6.3	4130-0000	0	---	X2	S5	275		CAP = P
25Y5	25.0	6100-5243	0	30	SH	S3	650	X	Dual Diode
25Z3	25.0	6100-5243	0	30	SH	S3	650	X	Dual Diode
25Z4	25.0	7200-5080	0	50	SH	S3	650		
25Z5	25.0	6100-5243	0	30	SH	S3	650	X	Dual Diode
26	1.4	4130-2000	39	---	X2	S5	350		
27	2.5	5130-2040	41	---	X2	S5	300		
30	2.0	4130-2000	43	---	X2	S5	275		
31	2.0	4130-2000	41	---	X2	S5	275		
32L7	35.0	7250-3480	16	---	X10	S4	300		Pent. Sect.
32L7	35.0	7200-6013	0	45	SH	S3	650		Rect. Sect.
33	2.0	5130-2400	27	---	X2	S5	400		
RK33	6.3	7104-3526	35	---	X2	S5	425	X	Dual Triode. CAP = G
34	2.0	4100-2300	16	---	X2	---	175		CAP = G. Hold down S1 and Press S5
35	2.5	5100-2340	20	---	X2	S5	300		CAP = G
35A5	35.0	8160-2370	0	---	X10	S4	300		
35Z4	35.0	7200-5080	0	50	SH	S3	650		
35Z6	35.0	7200-5384	0	50	SH	S3	650	X	Dual Diode
36	6.3	5100-2340	31	---	X2	S5	325		CAP = G
37	6.3	5130-2040	42	---	X2	S5	275		
38	6.3	5100-2340	35	---	X2	S5	325		CAP = G
39/44	6.3	5100-2340	25	---	X2	S5	300		CAP = G
40	5.0	4130-2000	20	---	X1	S5	125		
40Z5	50.0	7200-5080	0	53	SH	S3	650		
41	6.3	6140-2350	17	---	X4	S5	375		
42	6.3	6140-2350	23	---	X2	S5	625		
43	25.0	6140-2350	18	---	X4	S5	350		
45Z3	50.0	7100-2040	0	44	SH	S3	650		
45Z5	50.0	7200-5080	0	53	SH	S3	650		
46	2.5	5130-2400	0	---	X2	S5	625		
47	2.5	5130-2400	0	---	X2	S5	625		
48	25.0	6140-2350	45	---	X2	S5	625		
49	2.0	5130-2400	49	---	X2	S5	350		
50	7.5	4130-2000	60	---	X2	S5	475		
50Y6	50.0	7200-5384	0	45	SH	S3	650	X	Dual Diode
50Z7	50.0	7200-5384	0	45	SH	S3	650	X	Dual Diode
51/51S	2.5	5100-2340	20	---	X2	S5	325		CAP = G
HD51	OFF	0000-5020	---	---	VR	S9	150 V.		(155V. Regulation = 2 volts (from 5 to 30 MA.
57A	6.3	6100-2354	21	---	X2	S5	375		CAP = G
58A/58AS	6.3	6100-2354	17	---	X2	S5	500		CAP = G
VT67	2.0	4130-2000	43	---	X2	S5	275		
HY65	6.3	7250-0408	0	---	X4	S5	425		CAP = P
HY69	6.3	5130-0240	0	---	X4	S5	475		CAP = P
70A7	75.0	7250-3480	80	---	X4	S5	475		Pent. Sect.
70A7	75.0	7200-1000	0	58	SH	---	650		Rect. Sect. Reverse Meter Hold down S7 and Press S3

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT. COND.	NOTATIONS
71A	5.0	4130-2000	69	---	X2	S5	525	
79	6.3	6103-5240	13	---	X2	S5	300	X Dual Triode. CAP = G
81	7.5	4100-2000	0	0	SH	S3	400	
82	2.5	4100-3200	0	55	SH	S3	650	X Dual Diode
85	6.3	6100-2050	42	---	X2	S5	300	Triode Sect. CAP = G
85	6.3	6100-4352	42	30	SH	S1	400	X Dual Diode
85AS	6.3	6100-2050	26	---	X2	S5	375	Triode Sect. CAP = G
85AS	6.3	6100-4352	26	30	SH	S1	400	X Dual Diode
99	3.0	4130-2000	20	---	X1	S5	250	
112A	5.0	4130-2000	48	---	X2	S5	525	
CK113	50.0	7250-3486	32	---	X2	S5	550	Pent. Sect.
CK113	50.0	7200-6013	0	40	SH	S3	650	Rect. Sect.
HY114	1.4	7200-0000	22	---	X2	S5	350	Right CAP = P. Left CAP = G
117Z4	117.0	7200-5080	0	50	SH	S3	650	
183	5.0	4130-2000	79	---	X2	S5	475	
244A	2.0	5130-2040	42	---	X2	S5	150	
257A	3.0	4100-2000	16	---	X1	S5	300	CAP = G
259A	2.0	5100-2340	19	---	X2	S5	250	CAP = G
264C	1.4	4130-2000	20	---	X1	S5	300	
271A	5.0	5130-2040	32	---	X4	S5	400	
283A	2.0	5100-2340	28	---	X2	S5	300	CAP = G
285A	2.0	5100-2340	31	---	X2	S5	300	CAP = G
310A	10.0	6100-2354	20	---	X2	S5	475	CAP = G
311A	10.0	5100-2340	31	---	X2	S5	700	CAP = G
482A	5.0	4130-2000	79	---	X2	S5	475	
482B	5.0	4130-2000	58	---	X2	S5	475	
483	5.0	4130-2000	79	---	X2	S5	475	
485	3.0	5130-2040	37	---	X2	S5	400	
CK505AX	0.6	3540-1200	17	---	X1	S5	100	
CK510AX	0.6	4710-2306	0	0	SH	S6	50	Sect. No. 1
CK510AX	0.6	4760-5301	0	0	SH	S6	50	Sect. No. 2
CK556AX	1.1	4230-1000	26	---	X2	S5	500	
CK568AX	1.1	4230-1000	38	---	X2	S5	200	
CK569AX	1.1	3540-1200	8	---	X1	S5	525	
CK571AX	1.1	3470-1200	57	---	X1	S5	100	
CK573AX	1.1	2430-1000	34	---	X2	S5	625	
CK574AX	0.6	3540-1200	15	---	X1	S5	100	
CK605CX	6.3	3470-1265	10	---	X4	S5	675	
CK606BX	6.3	2300-1040	0	80	SH	S1	400	
CK608CX	6.3	3450-1060	22	---	X10	S5	300	
CK619CX	6.3	2340-1050	7	---	X10	S5	250	
717A	6.3	7240-8631	8	---	X4	S5	475	
814	10.0	5130-0240	0	---	X2	S5	750	CAP = P. Fuse lamp will glow brightly
SD828A	6.3	4630-1520	22	---	X4	S5	300	
SD828E	6.3	4630-0512	12	---	X10	S5	325	TOP LEAD = P
834	7.5	4100-0000	0	---	X2	S5	525	Near CAP = G Far CAP = P

MODEL 752 A

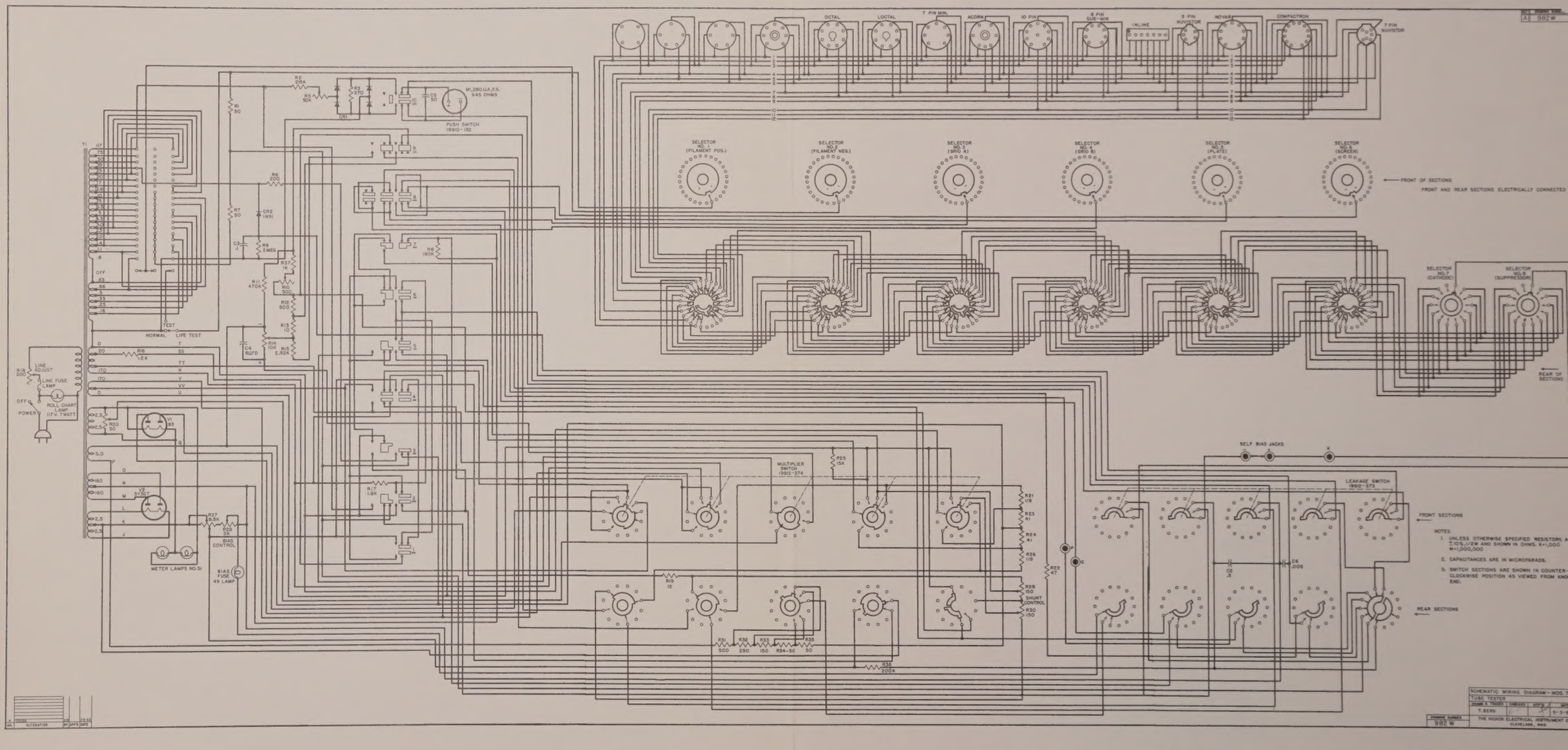
Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT. COND.	NOTATIONS
SD917A	6.3	3420-1050	10	---	X4	S4	425	
SN944	6.3	4630-0512	12	---	X4	S5	375	Top Lead = P
SN946B	6.3	2300-1040	0	80	SH	S1	400	
SN947D	6.3	3610-5780	44	---	X10	S5	300	
SN949C	6.3	3670-1052	#	50	SH	S3	650	Strikes at about 78
SN953D	6.3	3610-5720	15	---	X10	S5	350	
SN954	6.3	4200-1030	0	0	SH	S3	650	
SN954B	6.3	3600-2050	0	0	SH	S3	650	
SN956B	1.1	1200-0000	0	---	X1	S3	400	Top Lead = P. Connect Fil. leads to Pins 1 and 2
SN957A	6.3	5340-1020	25	---	X4	S5	425	
SN972D	6.3	3610-5740	13	---	X4	S5	475	
SN973B	6.3	3610-5740	16	---	X4	S5	475	
SN976C	6.3	3610-5780	44	---	X10	S5	300	
SD993C	6.3	3610-8050	19	---	X10	S5	300	
SD995B	6.3	3610-5740	13	---	X4	S5	475	
FM1000	6.3	8120-4536	0	---	X2	S5	225	Grid No. 1
FM1000	6.3	8160-4532	0	---	X2	S5	275	Grid No. 2
1005	6.3	6800-3050	0	93	SH	S6	650	Plate No. 1
1005	6.3	6800-5030	0	93	SH	S6	650	Plate No. 2
SN1006	6.3	5340-1200	9	---	X4	S4	225	
CK1027	OFF	0000-4070	0	91	SH	S6	650	CAP = P
E1148	6.3	7200-0080	12	---	X4	S5	350	Upper CAP = P Lower CAP = G
1247	0.6	4500-0000	0	0	SH	S1	400	Top Lead = P
HY1269	12.6	5130-0240	0	---	X10	S5	275	CAP = P. Short on 1-2
1291	2.5	1860-7000	27	---	X2	S5	475	Triode No. 1
1291	2.5	8130-2000	27	---	X2	S5	475	Triode No. 2
1602	7.5	4130-2000	44	---	X2	S5	375	
1616	4.3	4100-0000	0	30	SH	S2	650	CAP = P
1625	12.6	7140-0360	28	---	X4	S5	600	CAP = P
1626	12.6	7250-3080	46	---	X2	S5	650	
1629	12.6	7250-4080	0	100	SH	S5	---	Eye Open
1629	12.6	7250-4380	0	100	SH	S5	---	Eye Closed
1641	5.0	4100-0000	0	28	SH	S3	650	Left CAP = P
1641	5.0	1400-0000	0	28	SH	S3	650	Right CAP = P
1650	6.3	6140-3070	24	---	X2	S5	600	
1654	1.4	1700-0000	0	67	SH	S6	650	CAP = P
5517	OFF	0000-4070	0	40	SH	S2	650	CAP = P
5591	6.3	4310-5620	10	---	X4	S5	675	
5603	6.3	2740-8623	42	---	X4	S5	625	
5608A	2.5	7153-6240	17	---	X2	S5	475	I Dual Triode
5823	OFF	0000-1030	0	91	SH	S6	650	Place a 1 megohm $\frac{1}{2}$ watt resistor across pins 1 and 4 in Loctal socket
5901	6.3	3610-5740	16	---	X4	S5	475	
7193	6.3	7200-0080	23	---	X4	S5	475	Far Cap = G Near Cap = P

MODEL 752A

Supplementary Tube Test Data for Obsolete Tube Types

TUBE TYPE	FIL.	SELECTORS	BIAS	SHUNT	MULT.	PRESS	MIN. MUT.COND.	NOTATIONS
8005	10.0	4130-0000	0	---	X4	S5	400	CAP = P
38142	7.5	4130-2000	37	---	X2	S5	625	
XXB	2.5	1850-6000	10	---	X2	S4	350	Triode No. 1
XXB	2.5	8140-3000	10	---	X2	S4	350	Triode No. 2
XXD	12.6	8154-6372	27	---	X4	S5	325	X Dual Triode
XXFM	6.3	8130-2040	11	---	X4	S5	150	Triode Sect.
XXFM	6.3	8100-5647	0	77	SH	S1	400	X Dual Diode
XXL	6.3	8160-2070	23	---	X4	S5	400	


OCTAL
LOCTAL
7 PIN MIN.
ACORN
10 PIN
8 PIN SUB-MIN
INLINE
5 PIN NUVISTOR
NOVAR
COMPACTRON
7 PIN NUVISTOR
SELECTOR NO. 1 (FILAMENT POS.)
SELECTOR NO. 2 (FILAMENT NEG.)
SELECTOR NO. 3 (GRID A)
SELECTOR NO. 4 (GRID B)
SELECTOR NO. 5 (PLATE)
SELECTOR NO. 6 (SCREEN)
SELECTOR NO. 7 (CATHODE)
SELECTOR NO. 8 (SUPPRESSOR)
FRONT OF SECTIONS
FRONT AND REAR SECTIONS ELECTRICALLY CONNECTED
REAR OF SECTIONS
M1, 250 UA, F.S. 645 OHMS
PUSH SWITCH 19910-132
R1 50
R2 2154
R3 270
R5 50K
CR1
C5 50
R6 200
R7 50
CR2 IN91
C3 .1
R9 2MEG
R8 180K
R37 1K
R11 470K
R10 500
R12 500
R13 15
R14 10K
R15 2.92K
C4 8UFD
NORMAL
LIFE TEST
R16 1.2K
LINE ADJUST
R18 200
LINE FUSE LAMP
OFF
POWER
ROLL CHART LAMP (17 V. 7 WATT)
R20 50
V1 83
V2 5Y3GT
R17 1.8K
R27 8.5K
R28 35
BIAS CONTROL
METER LAMPS NO. 51
BIAS FUSE 49 LAMP
MULTIPLIER SWITCH 19912-374
R25 15K
R21 119
R23 41
R24 41
R26 119
R22 47
R29 150
SHUNT CONTROL
R30 150
R19 12
R31 500
R32 250
R33 150
R34-50
R35 50
R36 200K
SELF BIAS JACKS
LEAKAGE SWITCH 19912-373
C2 .5
C6 .005
FRONT SECTIONS
REAR SECTIONS
NOTES
1. UNLESS OTHERWISE SPECIFIED RESISTORS ARE ±10%, 1/2W AND SHOWN IN OHMS. K=1,000 M=1,000,000
2. CAPACITANCES ARE IN MICROFARADS.
3. SWITCH SECTIONS ARE SHOWN IN COUNTER-CLOCKWISE POSITION AS VIEWED FROM KNOB END.
SCHEMATIC WIRING DIAGRAM - MOD. 7
TUBE TESTER
DRAWN R. TAUSEK
CHECKED
APP'D
DATE
1 BERG
5-3-46
DRAWING NUMBER 982 W
THE HICKOK ELECTRICAL INSTRUMENT CO.
CLEVELAND, OHIO
A 982 W